86165 - PRE-OXYGENATION OF OBESE: EFFECT OF POSITION AND VENTILATION
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Introduction: Morbidly obese patients are at high risk of hypoxemia following induction of general anesthesia. Patient's position and ventilation strategy used during pre-oxygenation influence the safe non-hypoxic apnea length by their effect on functional residual capacity (FRC). Head-elevated positions including beach-chair position (ramp position) are currently recommended and used to provide a better laryngoscopic view during tracheal intubation. A positive pressure ventilation strategy during pre-oxygenation might benefit FRC, but is not used systematically. We hypothesized that FRC will be better after pre-oxygenation simulation in head-elevated positions (beach-chair and reverse Trendelenburg position) than supine position and after spontaneous ventilation with positive pressure versus spontaneous ventilation at zero inspiratory pressure.

Methods: Using a prospective crossover randomized trial design, we compared the FRC (helium dilution method in a physiology lab) following simulation of pre-oxygenation period according to different positions and ventilation strategies. After approbation of the local REB and written consent obtained, subjects underwent, in a randomized order, 6 simulations of pre-oxygenation strategy during 5 minutes. Pre-oxygenation strategies included a combination of one of three positions: supine (S), beach-chair (BC; 25° back inclination), reverse Trendelenburg (RT; 25° table inclination) and one of two ventilation strategies: spontaneous ventilation at zero inspiratory pressure (ZEEP-SV) or spontaneous ventilation with positive pressure provided by a mechanical ventilator (PP-SV) set to an inspiratory pressure of 8 cm H2O, PEEP of 8 cm H2O and FiO2 of 0.21. A mouthpiece and a nose clip were used in PP-SV and for FRC measurement to minimize leak. Pre-oxygenation simulations were separated by 20-minutes intervals in sitting position to minimize a potential alveolar recruitment from the previous intervention.

Results: Seventeen obese patients (BMI = 50 ± 8 kg/m2) were included. Mean FRC was significantly higher in RT compared to BC position (2483 ± 521 versus 2338 ± 469
mL, p=0.009), while there was no difference between S and BC (2359 ± 519 mL versus 2338 ± 469 mL, p=0.894). Mean FRC in the three positions (S, BC, RT) was also significantly higher using PP-SV compared to ZEEP-SV (2571 ± 477 versus 2215 ± 481 mL, p < 0.001). The pre-oxygenation strategy using PP-SV in RT position was associated with a 465 mL (21%) increase in FRC compared to ZEEP-SV in BC position (2684 ± 473 versus 2219 ± 477 mL; p < 0.001).

**Conclusion** Compared to supine, the beach-chair position did not increase FRC. Significant increases in FRC are observed when the patient is moved from beach-chair to reverse Trendelenburg position. Significant increases in FRC are observed when the spontaneous ventilation at zero inspiratory pressure is switched to positive pressure spontaneous ventilation. Finally, the strategy using the reverse Trendelenburg position combined with spontaneous positive pressure ventilation is superior to beach-chair position associated with spontaneous ventilation at zero inspiratory pressure.